

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* SCOTT LEE WELLINGTON,  
HAROLD J. VINEGAR,  
ERIC PIERRE DE ROUFFIGNAC,  
KEVIN ALBERT MAHER,  
ETUAN ZHANG, and  
AJAY MADHAV MADGAVKA

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Appeal 2006-3108  
Application 09/841,636  
Technology Center 1700

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Decided: April 6, 2007

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Before CHUNG K. PAK, CATHERINE Q. TIMM, and LINDA M. GAUDETTE, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the Examiner's final rejection of claims 4429 through 4448 and 5396 through 5405, all of the claims pending in the

above-identified application.<sup>1</sup> We have jurisdiction pursuant to 35 U.S.C. §§ 6 and 134.

## I. APPEALED SUBJECT MATTER

According to the Appellants (Specification 1):

The present invention relates generally to methods and systems for production of hydrocarbons, hydrogen, and/or other products from various hydrocarbon containing formations. Certain embodiments relate to in situ conversion of hydrocarbons to produce hydrocarbons, hydrogen, and/or novel product streams from underground hydrocarbon containing formations.

The Appellants acknowledge that heating various hydrocarbon formations in situ to recover hydrocarbons and hydrogen is known (Specification 2-9).

Referring to these admittedly known methods, the Appellants assert (Specification 9) that:

As outlined above, there has been a significant amount of effort to develop methods and systems to economically produce hydrocarbons, hydrogen, and/or other products from hydrocarbon containing formations. At present, however, there are still many hydrocarbon containing formations from which hydrocarbons, hydrogen, and/or other products cannot be economically produced. Thus, there is still a need for improved methods and systems for production of hydrocarbons, hydrogen, and/or other products from various hydrocarbon containing formations.

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<sup>1</sup> According to the Appellants (Br. 2), the above-identified application was originally filed with over 5400 claims.

The Appellants then state at page 10 of the Specification (under the Summary of Invention heading):

In an embodiment, hydrocarbons within a hydrocarbon containing formation (e.g., a formation containing coal, oil shale, heavy hydrocarbons, or a combination thereof) may be converted in situ within the formation to yield a mixture of relatively high quality hydrocarbon products, hydrogen, and other products. One or more heat sources may be used to heat a portion of the hydrocarbon containing formation to temperatures that allow pyrolysis of the hydrocarbons. Hydrocarbons, hydrogen, and other formation fluids may be removed from the formation through one or more production wells. The formation fluids may be removed in a vapor phase. Temperature and pressure in at least a portion of the formation may be controlled during pyrolysis to yield improved products from the formation.

A heated formation may also be used to produce synthesis gas. In certain embodiments synthesis gas is produced after production of pyrolysis fluids.

A formation may be heated to a temperature greater than 400 °C prior to contacting a synthesis gas generating fluid with the formation. Contacting a synthesis gas generating fluid, such as water, steam, and/or carbon dioxide, with carbon and/or hydrocarbons within the formation results in generation of synthesis gas if the temperature of the carbon is sufficiently high. Synthesis gas generation is, in some embodiments, an endothermic process. Additional heat may be added to the formation during synthesis gas generation to maintain a high temperature within the formation. The heat may be added from heater wells and/or from oxidizing carbon and/or hydrocarbons within the formation. The generated synthesis gas may be removed from the formation through one or more production wells.

The Appellants further state at pages 12 and 13 of the Specification that:

Various systems and methods may be used to provide heat sources. In an embodiment, a natural distributed combustor system and method may be configured to heat at least a portion of a hydrocarbon containing formation. The system and method may first include heating a first portion of the formation to a temperature sufficient to support oxidation of at least some of the hydrocarbons therein. One or more conduits may be disposed within one or more openings. One or more of the conduits may be configured to provide an oxidizing fluid from an oxidizing fluid source into an opening in the formation. The oxidizing fluid may oxidize at least a portion of the hydrocarbons at a reaction zone within the formation. Oxidation may generate heat at the reaction zone. The generated heat may transfer from the reaction zone to a pyrolysis zone in the formation. The heat may transfer by conduction, radiation, and/or convection. In this manner, a heated portion of the formation may include the reaction zone and the pyrolysis zone. The heated portion may also be located substantially adjacent to the opening. One or more of the conduits may also be configured to remove one or more oxidation products from the reaction zone and/or formation. Alternatively, additional conduits may be configured to remove one or more oxidation products from the reaction zone and/or formation.

In referring to the hydrocarbon product streams recovered from various hydrocarbon formations, the Appellants state at page 17 of the Specification that:

In an embodiment, compositions and properties of formation fluids produced by an in situ conversion process for hydrocarbons may vary depending on, for example, conditions within a hydrocarbon containing formation.

Certain embodiments may include controlling the heat provided to at least a portion of the formation such that production of less desirable products in the portion may be substantially inhibited. Controlling the heat provided to at least a portion of the formation may also increase the uniformity of permeability within the formation. For example, controlling the heating of the formation to inhibit production of less desirable products may, in some embodiments, include controlling the heating rate to less than a selected amount (e.g., 10 °C, 5 °C, 3 °C, 1 °C, 0.5 °C, or 0.1 °C) per day.

The subject matter on appeal is directed to hydrocarbon product streams from various hydrocarbon formations. See the claims on appeal. Details of the appealed subject matter are recited in illustrative claim 4429, which is reproduced below:

4429. A mixture produced from a hydrocarbon containing formation, comprising:

non-condensable hydrocarbons and H<sub>2</sub> wherein greater than about 10% by volume at 25°C and one atmosphere absolute pressure of the non-condensable hydrocarbons and H<sub>2</sub> comprises H<sub>2</sub>;

ammonia and water, wherein greater than about 0.5 % by weight of the mixture comprises ammonia; and

condensable hydrocarbon.

The remaining claims on appeal further recite different contents of hydrocarbons, hydrogen and less desirable products.

### *III. REJECTION*

The Examiner has rejected the claims on appeal (claims 4429 through 4448 and 5396 through 5405) under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over the disclosure of U.S. Patent 3,892,270 issued to Lindquist on July 1, 1975 (hereinafter referred to as “Lindquist”).

### *IV. ISSUES*

1. Is the product exemplified in Lindquist identical or substantially identical to the products embraced by the claims on appeal within the meaning of 35 U.S.C. § 102(b) or 103?
2. If the products covered by the claims on appeal and the product exemplified in Lindquist are not identical or substantially identical, would one of ordinary skill in the art have been led to arrive at the claimed products through routine experimentation or optimization within the meaning of 35 U.S.C. § 103?

### *V. PRINCIPLES OF LAW*

Where... the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. *See In re Ludtke, supra*. Whether the rejection is based on “inherency” under 35 USC 102, on “prima facie obviousness” under 35 USC 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO’s inability to manufacture products or obtain and compare prior art products. *See In re Brown*, 59 CPPA 1036, 459 F.2d 531, 173

USPQ 685 (1972) [Footnote omitted.] *See In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)

“[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.” *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

## VI. FACTUAL FINDINGS AND ANALYSIS

### ISSUE 1:

We determine that Lindquist’s hydrocarbon products are either identically produced or substantially identically produced as those embraced by the claims on appeal. We find that Lindquist, like the Appellants, describes economically recovering a gaseous product stream containing hydrocarbon values from a hydrocarbon-containing formation via employing steam and oxygen (col. 1, ll. 5-20, col. 3, ll. 3-16 and col. 7, ll. 20-48). In an exemplified embodiment, Lindquist teaches recovering gaseous hydrocarbon products by heating oil sand (a hydrocarbon-containing foundation) in the presence of steam and oxygen to a temperature of 600° F within one hour and to a temperature of 1500° F within 3 hours (col. 6, l. 52 to col. 6, l. 61). It can be inferred from this exemplified embodiment of Lindquist that its gaseous hydrocarbon products would necessarily include those produced at a temperature greater than 400° C, i.e., those produced between 600° F and 1500° F.

We also determine that Lindquist teaches a gaseous hydrocarbon product substantially identical to those encompassed by the claims on appeal. Specifically, we find that Lindquist teaches gaseous hydrocarbon

products having a fuel value varying from 70 to 500 BTU/SCF (col. 3, ll. 3-13). In an exemplified embodiment, Lindquist appears to teach a hydrocarbon product containing greater than 10% by volume of non-condensable hydrocarbons and hydrogen (col. 5 to col. 8, Table 2, together with col. 6, ll. 57-61).

Given similarities in the claimed and prior art products and in the claimed and prior art processes for making the same, we determine that the Examiner has properly shifted the burden to the Appellants to prove that Lindquist's products do not possess the claimed characteristics. *Best*, 562 F.2d at 1255, 195 USPQ at 433-34. On this record, the Appellants have not proffered any objective evidence to demonstrate that Lindquist's products are patentably different from those embraced by the claims on appeal.

*ISSUE 2:*

Even were we to conclude that the claimed product and the product exemplified in Lindquist are different, our conclusion would not be altered. As is apparent from Lindquist's disclosure discussed *infra*, recovering optimum or useful hydrocarbon products for given hydrocarbon containing formations is well within the ambit of one of ordinary skill in the art. *Boesch*, 617 F.2d at 276, 205 USPQ at 219. Lindquist, for example, teaches recovering products having a fuel value varying from 70 to 500 BTU/SCF from the same hydrocarbon sources described in the Specification (col. 3, ll. 3-13). Lindquist further teaches that the desired products can be obtained by varying various process conditions (col. 2, ll. 59-67).



*VII. CONCLUSIONS OF LAW*

In view of the factual findings set forth in the Answer and above, we determine that Lindquist would have rendered the subject matter recited in the claims on appeal either anticipated or obvious within the meaning of 35 U.S.C. § 102(b) or 103(a).

*VIII. ORDER*

The decision of the Examiner is affirmed.

*IX. TIME PERIOD*

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

Del Christensen  
Shell Oil Company  
P.O. Box 2463  
Houston, TX 77252-2463